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IX/1

Electrochemical intercalation of lithium in $Li_4Ti_5O_{12}$/C composite with different percentage of carbon

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$Li_4Ti_5O_{12}$/C composites with different content of carbon black (16 wt.% LITX200L, 32 wt.% LITX200L, 60 wt.% LITX200L, 61 wt.% PBX51) were prepared in two steps under identical conditions: hydrothermal reaction at 130 ^oC and post-calcination at 400 ^oC. The accent is on electrochemical measurements and how carbon content influences on electrochemical properties of $Li_4Ti_5O_{12}$/C composites. The $Li_4Ti_5O_{12}$/60% LITX200L composite showed best electrochemical performance: the cyclovoltammograms consisted of well defined reversible redox peaks at a scan rate as high as 10 mV/s, while, galvanostatic cycling showed coulombic capacity of 162 mAh/g at a discharging rate of 1C.

IX/2

Sol-gel synthesis of Li_2FeSiO_4/C

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Lithium transition-metal orthosilicates with general formula Li_2MSiO_4 (M = Fe, Mn, Co, etc.) have attracted a lot of interest due to their potentially high theoretical capacities arising from the possibility of the extraction of two Li-ions per formula unit. Li_2FeSiO_4 takes prominent position among this family of compounds due to its structural stability and natural abundance of iron. In this study, Li_2FeSiO_4/C composite was synthesized by simple method which involves rapid heating, short high-temperature delay, and subsequent quenching. Starting materials were Li_2CO_3, $Fe(NO_3)_3 \cdot 9H_2O$, $Si(OC_2H_5)_4$ (TEOS) and water-soluble methylcellulose. Precursor preparation is based on the sol-gel processing and provides homogenous mixing at the molecular level. Structural analysis, morphology examination and electrochemical test of thus obtained powder were performed.